AMENDED CLAIMS

[Received by the International Bureau on 13 December 2004 (13.12.2004): original claims 1-18 replaced by amended/new claims 1-22; (2 pages)]

1. A process for driving a prime mover, said process comprising

a) positioning a selective membrane having an average pore size of at least 10 Angstroms between a liquid and a solution having a higher osmotic potential than the liquid, such that the solution becomes pressurised by the influx of liquid across the membrane,

b) using the pressure generated in the solution to drive a prime mover,

c) recovering the solution,

d) separating at least some of the solvent from the solution to form a residual product, and

e) recycling the separated solvent and/or the residual product of step d) to step a).

2. A process as claimed in claim 1, wherein the prime mover is a rotary prime mover.

3. A process as claimed in claim 1 or 2, wherein the prime mover forms part of a pressure exchange system.

4. A process as claimed in any one of the preceding claims, wherein the solution is an aqueous solution.

5. A process as claimed in any one of the preceding claims, wherein the solution is solution of a salt selected from sodium chloride, potassium chloride, potassium nitrate, magnesium sulfate, magnesium chloride, sodium sulfate,

calcium chloride, sodium carbonate, disodium hydrogenphosphate and potassium alum.

6. A process as claimed in claim 4 wherein the aqueous solution is formed by dissolving ammonia and carbon dioxide in water.

7. A process as claimed in claim 6, which is an aqueous solution of ammonia, carbon dioxide, ammonium carbonate, ammonium bicarbonate and ammonium carbamates.

8. A process as claimed in any one of the preceding claims, wherein the solution has a solute concentration of 1 to 400 weight %.

9. A process as claimed in any one of the preceding claims, wherein the liquid is selected from the group consisting of freshwater, seawater, brackish water and a waste stream from an industrial or agricultural process.

10. A process as claimed in any one of the preceding claims, wherein the liquid is or comprises the same solvent as the solvent of the solution.

11. A process as claimed in any one of the preceding claims, wherein solvent is removed in step d) by a thermal and/or membrane separation method.

12. A process as claimed in claim 11, wherein the solvent is removed using a method selected from evaporation, distillation and crystallization.

13. A process as claimed in claim 12, wherein the solvent is removed by at least one method selected from multi-stage flash distillation, multi-effect distillation, mechanical vapour compression and rapid spray desalination.

14. A process as claimed in claim 11, wherein the solvent is removed by at least one method selected from ion-exchange, electrodialysis nanofiltration and osmosis.

15. A process as claimed in any one of the preceding claims, wherein the energy required to remove solvent in step d) is provided by the wind power, thermal energy of the surrounding environment, solar energy, geothermal energy, energy from a biological process, energy from the combustion of fuel and/or excess heat from power plants and other industrial processes.

16. A process as claimed in any one of the preceding claims, wherein at least some of the solvent recovered in step d) is recycled to a liquid for step a).

17. A process as claimed in any one of the preceding claims, which comprises using the pressure generated in the solution to transfer the solution to an elevated location, and using the potential energy of the elevated solution to drive the prime mover.

18. A process as claimed in any one of the preceding claims, wherein the solution from step a) is transferred to an elevated height where the ambient temperature is
(i) low enough to crystallize at least some of the solute in the solution, or

(ii) below the freezing point of the solvent to crystallize the solvent,

such that the solution is separated into a portion having a low solute concentration and a portion having a high solute concentration.

19. A process as claimed in claim 18, wherein each of said portions is returned to ground level, such that the potential energy of each of the portions can be used to drive the prime mover.

20. A process as claimed in any one of the preceding claims, wherein the thermal energy required to separate the solvent from the solution is step d) is provided by the compression and decompression of gas.

21 A process as claimed in any one of the preceding claims, wherein the selective membrane of step a) has an average pore size of 10 to 60 Angstroms, preferably 12 to 50 Angstroms.

22. An apparatus for driving a prime mover, said apparatus comprising

a prime mover,

a housing comprising a selective membrane having an average pore size of at least 10 Angstroms for separating a liquid from a solution having a higher solute concentration than the liquid and configured such that liquid passing through the membrane pressurises the solution,

means for transmitting the pressure generated in the solution to the prime mover,

means for recovering the solution,

means for separating solvent from the solution to produce a residual product, and

means for recycling the residual product and/or the separated solvent to the housing.